

CARB 2011 TSA Findings

General / Over-arching Findings:

[MP1] CARB needs to complete the process of putting a formal PQAO into place. [previous finding M1]

ARB has taken steps to strengthen the CARB PQAO by:

- Appointing a PQAO contact
- Improving the field audit and technical audit program of PQAO Districts
- Beginning to provide QA training
- Reviewing PQAO Districts' quality control data prior to routine data certifications
- Beginning to review PQAO Districts' SOPs
- Starting a process to put in place agreements with PQAO Districts
- Evaluating and controlling the standards used by the PQAO through the standards laboratory and during technical audits

Steps that still need to be taken include:

- Formalize PQAO relationship (e.g., send letter with MOU – SOPs, QAPPs, etc.)
- [MP5] Implement training program
- Improve coordination and communication
- Improve data quality oversight

[MP4] QA does not have the structure or staff to manage QA oversight of the PQAO Districts.

[MP3] While progress has been made on updating the CARB QA Manual with a QMP and QAPPs (or equivalent) the process is behind schedule. [previous finding M6]

[MP2] QA Authority between QMB and the other Branches need to be extended and formalized. [previous finding QM1]

[MP6] The corrective action process needs to be expanded to cover all aspects of ambient air monitoring. The current system is limited to actions issued by the QA auditors or the calibration laboratory. [previous finding M3] (see SC 2007 A4 and BAAQMD 2009 F-QA3)

[MF/KH/GY] Coordination between CARB and districts (e.g., Imperial County, SJV, and Mendocino County) and EPA needs to be improved.

- New valid PM2.5 samples found at San Diego that impacted a regulatory decision
- Issues with CARB data validation for Imperial and Mendocino
- Site relocation in SJV

Network Design

[MK] The current network plan process does not allow determination of network adequacy. Not all agencies within the PQAO have approved network plan. Similarly, the network assessment does not conform to CFR requirements...

[MK] Design Value / high sites have been moved without evaluation of representativeness of new monitoring site, potentially jeopardizing regulatory decisions (e.g., Arvin and Sonora-Old Oak Ranch Rd.).

[MK] There are PM10 monitors listed in local conditions (LC; parameter code 85101) only in AQS. All PM10 measurements collected with FRM/FEM instruments are required to be entered into AQS as STP (parameter code 81102). It is acceptable to report data under both parameter codes. The following CARB monitors were identified as being entered under only LC code:

- South Lake Tahoe (060170011), POC 2
- Mojave – Poole (060290011), POC 3
- Bakersfield – California (060290014), POC 5
- Paso Robles (060792004), POC 2
- San Luis Obispo (060794002), POC 3
- Santa Barbara (060830011), POC 1
- Santa Maria (060831008), POC 2

The following non-CARB sites that are within the CARB PQAO were identified as being entered under only LC code:

- Brawley (060250007), POC 3, Imperial County APCD
- Niland (060254004), POC 3, Imperial County APCD
- Corcoran (060310004), POC 7, San Joaquin Valley Unified APCD
- Madera (060392010), POC 3, San Joaquin Valley Unified APCD
- Lakeport (060333001), POC 2, Lake County AQMD
- Anderson Springs (060333010), POC 1, Lake County AQMD
- Glenbrook (060333011), POC 1, Lake County AQMD
- Nipomo (060794002), POC 2, San Luis Obispo County APCD

Field

[GY] Positive Finding: Monitoring field operations manager is instituting quarterly meetings with all field staff in order to improve communications. EPA supports this as a way to improve consistency and coordination between the field staff across California.

[EF] Positive Finding: CARB has extensive and well developed “Acceptance Test Procedure” forms for their monitoring equipment.

[EF] Positive Finding: CARB does a good job of maintaining and tracking information related to monitoring equipment purchase orders.

[EF] Positive Finding: CARB maintains a wealth of replacement parts and instruments that allows for minimal instrument downtime.

[MK] Site operators are not consistently following protocols to ensure data collection is in accordance with regulations and guidance. Poor site operation has resulted in compromised data sets for critical sites. Examples include:

- Bakersfield-Planz is the high site for San Joaquin Valley PM2.5 and has completeness issues and documentation issues (e.g., filter COCs with white-out) DV.
- Sutter Buttes is the design value site for its ozone non-attainment area and has completeness issues which could jeopardize use for regulatory decisions.

Throughout the CARB sites we visited we observed site operators, while generally dedicated, unaware of regulatory data collection requirements. Site operators expressed a feeling of disconnectedness and did not understand the reasons or importance for procedures and protocols implemented for regulatory data collection. Examples of site operators not adhering to regulations and guidance include:

- Improper and inadequate documentation (see Finding X)
- Not having current residence time or re-calculating residence time after removal/change of instrumentation [GY/MP]
- PM10 make up samples are not being taken in accordance with EPA guidance [GY]
- PM samples being held at the site beyond the allowable post-collection hold time (see Finding Y)

Recommendation: [GY] Training is needed for new operators and for all site operators when SOPs are revised. Refresher courses would also be useful. Monthly site operator meetings. Standard logbooks (or electronic) that get checked regularly. Regular visits by managers.

[MK] Management oversight of site operators needs strengthening.

As stated in Finding Z, the site operators are not consistently following EPA regulations and guidance for regulatory ambient air quality data collection. Due in part to the geographic extent of the network, management oversight of the site operations is especially challenging. Nonetheless, procedures for management controls are needed to ensure that site operations produce robust data for regulatory decisions.

Recommendation: Managers need training. Managers need more regular site visits with checklists. Managers need to review logbooks (consider going to electronic logbooks), calibrations, maintenance logs, etc.

[MP9/GY] CARB does not have a uniform program for producing and reviewing site documentation. [Related Previous Finding GB3, SJV3, & NS2] – see finding C1 of SC 2007 report and finding 3.4 from 2001 BAAQMD (found in background docs of 2009 TSA).

- Found at Yuba City: pencil – eraser clearly used in some places; no initials of person for most entries; no Manager review; entries limited and incomplete – not noting who was present – instruments not referred to with identifying numbers; PM10 QC checks are not consistently recorded - no place on monthly check sheet to note when they take place; no instrument maintenance logs [MP13]; instrument issues and maintenance not consistently documented in other records [MP13]; inadequate records to justify nulled data
- Found at Calexico Ethel: inadequate documentation kept on-site (no monthly maintenance sheets; annual certification for delta-cal, copies of PM2.5 COD forms, previous logbooks, etc.); current logbook is a collection of sheets in a binder; no documentation for annual calibration or verification of PM10 flow orifice; records kept in pencil

[MK] Delay in sending samples has resulted in loss of data. Yuba City – Samples were held too long at station post-collection, resulting in immediate conditioning/weighing in lab (12/4/10) and occasional invalidation (9/22/10 and 6/17/10 through 6/20/10).

[MP8/GY] Span and precision gases used in the field are not being routinely calibrated (e.g., expired gas cylinders in field stations).

[EF] Instruments replaced in the field are not always efficiently tracked and returned to the repair lab facility for diagnosis, repair, and reinstallation. This can result in loss of data due to unavailable spare instrument (e.g., Sutter Buttes summer 2011).

[MP12] Siting issues for Yuba City Site

- Trees
- Ozone too close to road
- Location needs to be updated in AQS
- PM BAM obstructed by roof and trees – not used to compare to NAAQS

[MF] Siting at Calexico Ethel needs to be evaluated if the site is not relocated.

- Distance to tree line
- Distance of PM2.5 samplers to shelter
- Equipment spacing on roof
- Comparison of PM2.5 BAMs and filter based PM2.5 samplers may not be appropriate

Calibrations

[MK/GY] SOP and documentation needed on what triggers a calibration after a repair/reinstallation. For example, no calibration was done after a major repair at Colusa (Oct. 2010) – this may have been acceptable but there is no rationale or documentation for this decision. Calibration staff determine whether a cal is needed based on info from station operator but we could not find a record of this decision.

[MK] Calibrations not being done consistently every 6 months (e.g., >9 months at Willows, >16 months at Colusa). (See SC 2007 report C4)

[MP14] Multipoint calibrations of PM2.5 instruments are not done routinely.

[MP15] The number of NO2 titration points implemented during calibrations does not meet regulatory requirements. [Previous Finding AQSB7]

[MP16] Mass flow elements (MFEs) are used to establish calibration points outside of their calibrated range.

[MP18] Recommendation: The flow calibration laboratory has not established criteria for temperature, pressure, and humidity stability.

[MP19] AQSB is not formally documenting the quality of zero being used in the program.
[Previous Finding AQSB8]

PM Lab

Positive Finding: PM lab is very well organized and does thorough data review.

[MF] Communication of post weigh information and transmission of documentation to local districts could be improved. [previous finding IL8]

[MF] Recommendation: PM10 trip blanks are not being used to assess potential bias from field operations.

[MF] Recommendation: Documentation of activities in the PM10 and PM2.5 labs could be improved.

- Temperature/humidity
- Electrostatic strips
- Preconditioning time periods
- No overall PM10 lab logbook

Data Management

CARB Sites:

[MK] Good monthly data reports for continuous data.

[MK] Data within the CARB PQAO are not validated using consistent procedures. [previous finding M7] Determination of valid/invalid data made by site operator and then implemented by data validator creates inconsistent data validation procedures.

Recommendations:

- Finalize SOPs for the data validation and review/verification procedures in the AQSB, NLB, and AQDS. [previous finding DM1, DM2, DM3]
- Validator should make final decision on data validation issues and document the justification for the decision.
- Data validation SOP should address when data can be treated as valid after installation but before calibration or audit (i.e., instrument installed and passes cal/audit within x timeframe of repair/installation).
- CARB should ensure that all local Districts having the responsibility for submitting data directly to AQS follow consistent procedures for reviewing and validating data before they are submitted to AQS.

[MK] Numerous incorrect data entries were identified for CARB sites that were not detected by any data validation or data review process.

Recommendation: need visualization tools.

[MK] Data audits are needed [related to previous finding QA5].

Staff and managers at CARB and the districts within the CARB PQAO are generally diligent in collecting robust data; however, there is a need for data audits to detect missed/systematic issues in the dataset (e.g., anomalous data, large data gaps, systematic missing data). Through data audits, EPA identified the following data issues:

- Healdsburg – step change to ozone below background levels (see finding X)
- Red Bluff – 0.02 ppb ozone for the entire month of April 2009
- Yuba City – missing data that was valid

[MK] Data at Healdsburg is spurious. The problem needs to be identified, data appropriately validated, and issue resolved.

[MK] Not all data within the PQAO is certified.

District Sites:

[MK] Unvalidated continuous data are being entered into AQS [related to previous finding DM5].

According to the CARB AQDS Data Management SOP, CARB does not review data from districts but instead submits it as-is if it passes the AQS routines for outliers.

- Mendocino County APCD expects that CARB is reviewing data and on this basis is relying on CARB to enter zero/spans appropriately. It is not CARB policy to do this so erroneous data has been and continues to be entered into AQS.
- Healdsburg ozone data is erroneous and was not properly validated by Northern Sonoma County APCD. Without any subsequent review by CARB these data were and continue to be entered into AQS and certified by CARB.

CARB certifies data for agencies it submits data for. CARB submits and certifies gaseous and continuous PM data for the following districts: Imperial County APCD, Lake County APCD, Mendocino County APCD, North Coast Unified APCD, Placer County APCD, Sacramento Metro AQMD, Siskiyou County APCD, Tehama County APCD, Yolo Solano APCD, and Northern Sonoma APCD. CARB is not reviewing any district data other than P/A data. CARB does not have certainty that data are valid prior to certification.

[MK] CARB has altered district data without communicating with districts – this contradicts CARB's AQDS Data Management SOP and the **MOU**.

- Mendocino data has 0's in file submitted to CARB but it is missing in AQS. The CARB data reviewer removed these data points without conferring with Mendocino County APCD.
- Imperial County has missing data in AQS for periods that they did not nullify. CARB nullified data without conferring with Imperial.

Some district sites that are in the CARB PQAO are listed as their own PQAO (e.g., Tehama County, Mendocino County, Great Basin).

Quality Assurance

[MP7] Quality assurance for special projects is not being developed in a process that is consistent with EPA quality system requirements. [Previous Findings M4 & OPA2]

[MP11] The QA Audit has made an effort to improve their documentation, however there were still several discrepancies noted.

[MP17] The audit trailer evaluated was utilizing one expired gas cylinder and others that had not been certified annually as required for the EPA National Performance Audit Program.

[MP22] The QA Section is not tracking to ensure that 25% of monitors are being audited per calendar quarter.

[MP21] Some ozone primary Stds from PQAO not coming to CARB (examples Santa Barbara and Ventura)

[MP20] Two audits performed in one day cannot be loaded into AQS.

[MP23] The meteorological audits are not as comprehensive as used by other agencies.

[MP24] The connection to the inlet could pull in outdoor air.

[MP25] New instruments for Temp and RH don't have maintenance logbooks yet.

[MP26] Manifold pressure is being check by the auditors but not recorded.

[MP27] Auditors do not review all applicable siting information in AQS prior to an audit.

Lab Findings

Canister Cleaning

1. The canister SOP does not currently reflect the cleaning procedure, and the number of cycles being used for a newly acquired cleaning system where the number of cycles has been reduced from 9 to 5 . Staff stated the SOP is being re-written.
2. There is no SOP documented for the batch certification of cleaned canisters. Furthermore, the canister cleaning SOP lists clean up criteria for MLD 022, but not for MLD 066.
3. The batch certification of cleaned canisters described differs from guidance in that 1 canister out of a batch of 12 canisters cleaned is tested for residual contamination as part of the certification process. Guidance recommends that 1 canister out of a batch of 8 should be certified. (Discussed with them the possibility of keeping a running tally of the number of failed to total canisters tested as a possible better metric that the entire batch has been successfully

cleaned or trend charting the contamination level as an early warning system for performing cleaning instrument maintenance as proposed by San Diego APCD.)

4. **Repeat.** Pre-clean up concentrations are not recorded in a history logbook to allow for the selection of the most highly contaminated canister for batch certification. Instead, canisters are randomly selected for certification. However, as a result of the previous TSA, CARB has initiated a system of marking canisters that have been selected for testing as part of the batch certification to ensure that eventually all canisters have been tested.

5. Canisters are not routinely leak tested as prescribed. Instead canisters are vacuum leak tested only when leaks are suspected.

6. The (2) cleaning systems do not have maintenance logs.

7. **Repeat Finding.** A retention time policy for canisters once they have been certified clean after which they should be re cleaned and blanked has not been established (TAD 2.5.3.6) Julia Hodgkins confirms that she observes contamination appear in cleaned canisters with time. I discussed this in further detail with staff than last time and they appeared interested this time in the possibility of micro leaks as discussed in the (PAMS) TAD, and possible internal outgasing which they hadn't considered.

8. The SOP states that old canisters are reconditioned. This is inconsistent with practise. Staff stated that this procedure was determined to be ineffective and has been discontinued. (heard same thing at the Dallas conference).

9. Noted. Air is now released from canisters in a fume hood. This represents corrective action from the previous TSA.

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Carbonyl Department - MLD 022

1. Noted that CARB uses a 24 hour sampling method. Discussed with them research shows sampling times longer than 6 hrs can result in low recoveries for acetaldehyde and compounds other than formaldehyde, and provided a copy of the Rutgers publication for future follow up and possible discussion. Requested possible feedback.

2. CARB has not established a holding time for cartridges once samples have been collected for extraction or analysis, but stated they "are working" toward a holding time. Furthermore, staff stated cartridges are kept a couple of weeks in the field before shipping them to the lab. Staff stated that cartridges are generally analyzed within the four weeks recommended by the Waters cartridge vendor, but not the 14 days specified in Method TO-11 or 30 days following extraction specified in the method.

3. A retention time has not been established for unused DNPH cartridges after which a new cartridge lot blank should be analyzed; this presents a potential contamination issue, and is outside TO-11 method guidance.
4. CARB's procedure for analyzing DNPH lot blanks differs from their written SOP. The CARB SOP states that 5% of new DNPH cartridges will be analyzed as lot blanks, but staff stated the practise has been changed to one cartridge per lot vs the old procedure of 1 per box.
5. No criteria is stated in the CARB SOP for passing DNPH lot cartridge blanks. Staff stated the criteria is 2X RL (sounds high).
6. Gloves are not worn as a contamination protection measure when handling cartridges. A nitrogen bag is not used for extractions.
7. **Repeat Finding.** CARB is not analyzing field blanks which Method TO-11 specifies at a frequency of 10% of field samples. During the previous TSA staff stated CARB was correcting sample results based on a average of field blank results from a study performed 15 years prior (they shouldn't have used outdated data and shouldn't have been correcting sample reported results). Bottom line, what are they really doing now? Same thing? Staff stated they are not correcting sample result based on the old study.
8. CARB does not analyze trip blanks which Method TO-11 specifies at a frequency of 10% of field samples.
9. Noted the analyst did not know the passing or failing criteria for duplicate sample analysis.
10. CARB does not control chart the percent difference of replicate analyses as prescribed in Method TO-11, but stated they are in the process of gearing up to do this.
11. Noted that the analyst stated a different (narrower) passing criteria than specified in the CARB SOP for spiked samples, and was hesitant re: corrective action in the instance that spikes fall outside criteria.
12. Staff stated that working standards are tracked and used for 6 months. This differs from the CARB SOP which states a retention time under refrigeration of 4 months (I suspect the analyst didn't know the retention time).
13. The second source standard is from a different lot, but the same vendor as the primary standard. This represents an improvement from the previous TSA where a dilution of the primary standard was used as the control standard. It would be preferable to purchase the second source standard from a different vendor though. A standard from the same vendor, but different lot may not classify as a second source standard.
14. CARB does not currently analyze PE samples, but staff stated they have been looking into purchasing carbonyl PE samples from Wibby Environmental. (I noted they are analyzing spiked samples).

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Hexavalent Chromium
MLD

1. CARB would benefit from a better system of labeling samples. Site name and sampling dates are recording on a piece of tape loosely sticking to sample cartridges. The analysts agreed that often the labels fall off, and it is difficult to tell which samples are which.
2. CARB does not analyze trip blanks or field blanks. Trip blanks and field blanks may be important given that Cr^{+3} is ubiquitous, and CARB is reporting very low levels (?).
3. Positive finding. Data undergoes peer review, supervisory review, review by the Branch Chief, and before going to AIRS (cross reference to the Organics Department).

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Oxygenated Hydrocarbons & Nitriles (Modified TO-15)
MLD 066
Acrolein, Ethanol, Acetone, Acetonitrile, Acrylonitrile, Benzene

1. A dedicated maintenance logbook has not been established.
2. There is no instrument run logbook.
3. Appendix V in the CARB SOP lists the standards that were being used in 2003. but the list has not been update to reflect the standards that are currently being used which are currently reported in the QC report.
4. CARB is using the external method of standardization due to difficulty in finding a suitable internal standard. Discussed with them under these circumstances the possibility of preparing a series of external standards at differing humidity, and using 1 internal standard as a check on instrument sensitivity fluctuation. According to Professor Riemer when I asked, key is having the water vapor in the samples similar to the standards which is why he analyzes a series. Professor Riemer reports that he observes a 10-15% variation during the course of a day due to water which the internal standard compensates for (want to investigate more with him about his process).
5. There is no SOP at the workstation.
6. CARB does not analyze a standard near the MDL other than annually when analyzing the multi point in case the LOD has changed; staff responded they thought it was a good suggestion.

7. CARB does not analyze audit samples or through the probe audit samples as suggested in Sec. 9.7 of the SOP (we have been looking into sending them one for this analysis; they are difficult compounds).

8. Staff stated there is no system of peer or formalized Supervisory review, although they are working on it. Kathy Gill reportedly looks at the reports (reference multilayered review in Inorganics hexavalent chromium section as a best practise).

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Aromatic and Halogenated Compounds, VOCs MLD 058

1. There is no secondary review of logbooks.
2. CARB stopped conducting through the probe audits; the department has reportedly been asking for them to be re-started.
3. Staff stated there is no system of peer or formalized Supervisory review, although they are working on it. Kathy Gill reportedly looks at the reports (reference multilayered review in Inorganics hexavalent chromium as a best practice).

SJVAPCD mini-TSA

Positive Findings:

1. There is generally very good communication between monitoring and planning staff and management.
2. Management and staff at all levels are actively engaged in improving the program including monitoring systems and other data collection processes.
3. Field operators are skilled and knowledgeable.
4. Good hands-on training, information sharing and issues communication via meetings every other Monday.
5. Setting up a new system for verifying zero air generators
6. Maintenance and Calibrations are scheduled to minimize downtime.
7. Working towards more remote data access and a new data management system.
8. Currently, there are three levels of independent data review and the process is well documented.
9. Most data completeness issues related to instrument operation is improving due to implementation of operational changes, such as checking data remotely. Some completeness issues remain – see the Network Management section.

General / QA

1. QA Documentation:
 - a. SJVAPCD does not have an up to date QMP, QAPP or SOP for all activities. SJVAPCD could adopt CARs QA documentation, develop their own or adopt CARB's documentation with changes to match their program. Any deviation from the CARB QA documentation must be formally approved by CARB as the lead agency in the PQAQ.
 - b. All levels of staff and management should be engaged in the development and/or review of SOPs to ensure they reflect SJVAPCD's operations and program.
2. SVJAPCD does not have a corrective action process described by an SOP. While corrective action seems to be currently occurring in a timely fashion for most issues, a formal corrective action process would serve as documentation for the issues being resolved, capture the process and keep it consistent through staff or management turnover, and distribute results of the corrective action to staff.

Network Management

1. Data Loss: There have been several recent examples of significant data loss at critical sites due to downtime for temporary site closures for construction or upgrades and site relocations, including the Corcoran and Bakersfield-Golden State Highway sites. EPA agrees that the upgrades are necessary for safety and long-term longevity of a station, and that the site relocations in question were largely driven by circumstances beyond SJVAPCD's control. However, changes could be implemented that would minimize the amount of data loss such as better communication between and within the agencies involved, and the construction of temporary sites to cover data collection during site closure.
2. Network modifications process: CARB and SJVAPCD have both initiated network modifications for many sites in the SJVPCD without seeking EPA approval per 40 CFR 58.14. For this process the operating agency for the site should work with the other agency and with EPA to develop a plan for site closure or relocation that meets everyone's needs and federal requirements. This is particularly crucial for high concentration or design value sites in order to develop acceptable plan for concurrent monitoring at old and new sites in order to meet future data needs.

Field Overview

1. The residence time of flow between the inlet and each instrument was not posted at each site. The site operators did not know how recently the residence time had been recalculated. At a minimum, the residence time should be calculated for each instrument after any change is made to the sampling train, such as the removal or addition of other instruments, and posted at each site.
2. Monitoring manager plays a very active role in quality control of the work from his staff by extensive oversight including in-person site visits and checks of log books and maintenance sheets. This practice is very useful and should be well-documented by initialing the site logbook or maintenance sheet. Also, if the vacant position of senior

technician were filled, they could assume some of the demands currently on the manager, such as this.

3. As new tools are developed for data access and review, SJVAPCD should consider the use of control charts to track long-term performance of the instruments.
4. Overall documentation at sites was generally thorough; however, EPA noted that more specifics could be included consistently in logbooks at the site. For example, an entry noting that maintenance was performed on a certain date should include the instrument and either what specific activities were performed or where that information can be found.

Instrument Repair / Standards & Calibration

1. The Environics 6300 should be verified against a NIST-certified SRP at CARB or EPA R9 Laboratory. [double-check]
2. There is not consistent documentation of certification or verification for all standards. SJVAPCD should work with the QAG at CARB to develop a system that ensures that all standards are meeting the requirements for certification, and that these results are fully documented.
3. There is a lack of communication between the CARB standards lab and other agencies in the PQAO about downtime experienced by the CARB standards lab, expected time for return to service, and alternatives for other agencies to use while CARB's services are unavailable.
4. Downtime results from running instruments past the expected life cycle and past the time when support from the manufacturer is available. SJVAPCD should compile a list of equipment replacement needs and share with EPA Region 9 in the event that equipment replacement funds become available.

Data and Data Management (continuous gas and PM monitors only)

1. It is unclear that appropriate criteria are being used to invalidate or flag data – specifically continuous PM data. EPS will work with SJVAPCD to determine what these criteria should be and how to handle the data already submitted to AQS.
2. While the current three-level data review process is very thorough, doing this process entirely by hand is inefficient and very time-consuming. Implementing a new data management system should decrease the amount of time needed for this task and free up much-needed resources. In developing a new system, EPA encourages the participation of all involved in the current review process, as well as outreach to other monitoring agencies that have recently developed these systems to ensure that any system under consideration encompasses any necessary features.

Imperial County Findings

1. The Imperial County APCD has not established an appropriate quality system for ambient air monitoring

- No approved QAPP
 - Established DQOs are not used to track data quality
 - Level 1 data validation is not performed by site operators
 - No formalized training program
 - Record keeping/documentation
2. One point QC checks (flow verifications) for PM10 and PM2.5 are not consistently performed by site operators.
 3. Residence time for gaseous monitors is not calculated and tracked
 4. Monitoring staff is internally post weighing filters without proper PM lab or quality control measures
 5. Neighborhood scale may be inappropriate for PM10 at the Westmorland site
 6. Need to assess PM10 sampling frequency throughout network
 7. Current database is not flexible and prevents staff from adequately reviewing and editing data

Mendocino County APCD Findings

QA/QC

- Make sure operators are familiar with relevant ARB QAPPs and SOPs
- Have QAPPs and SOPs on hand – in hard copy and/or electronically
- (Have ARB QMP on hand – in hard copy and/or electronically ?)

Data

- Develop system for reviewing data ARB inputs into AQS
- Clarify how ARB is inputting flags into AQS and how they determine whether data should be entered or not.
- Internal QAPP for data validation/review

Documentation

- Documenting data review process – review CARB QAPP with ARB, determine who is doing what
- Recommend keeping a binder that has all of the “cover emails” MC AQMD sends to ARB, along with the quarterly data, detailing any data notes.
- Corrective Action Reports : Bob does a lot of trouble shooting; make sure concern (trigger) and solution are clearly documented and kept in an easily findable location.
- Recommend taking all notes in pen, initialing, and having a record of what initials stand for what person.

- Recommend putting maintenance log for O3 in with the station log; put voltage sheets in binder.
- Enter down times.

Siting & Sites

- Ukiah, Gobbi – internal shelter temperature. Site operator said that he discovered the temperature probe was outputting data that was 4 degrees off. He therefore corrects all internal shelter temperature data by 4 degrees in the spreadsheet. There is no documentation on how the offset was discovered, the process used to identify the problem, and how the solution was reached. This should be logged as a corrective action.
- Ukiah, Gobbi – internal shelter temperature. Making a manual correction to data does not seem appropriate. How will you know if the correction factor is no longer 4 degrees? Why is the temperature probe reading incorrectly? Recommend finding a different way to address this problem.
- Ukiah, Gobbi – watch that tree drip lines aren't closer than 10 meters to the probe and that they aren't obstructing flow to the probe.
- Ukiah, Gobbi – recommend having residence time calculated & printed out, posted at site.
- Ukiah, Library – keep an eye on the tree heights. Probably far enough away from the inlet that you don't have to worry about them immediately, but good to monitor.

General

- Support training Barbara as back-up for Bob.
- Staff – support more staff. Such as seasonal staff for open burn season, for minor enforcement.
- Mendocino County AQMD should not be listed as a PQAO in AQS
- Met – as you install new met, consider making it “official” data.

Positives

- Excellent instrument troubleshooting
- Stations well maintained
- Staff very knowledgeable about area and sources
- Envistas good tool.

Issues raised by Mendocino:

- ARB: Overall monitoring contact for the district.
- ARB wants 3 years of clean PM10 data. Would rather monitor for PM25. Can they monitor for a shorter amount of time and then switch over?
- Resources for training. Funds for national trainings, and having good ARB trainings (focus on equipment & day to day; data validation, etc).

Future projects:

- Moving PM10 at Ft. Bragg. Looks fine.
- New ozone analyzer. One year side by side with NOx based ozone. ARB to do side by side calibration at the start.